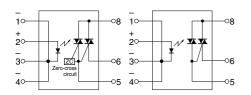


## **Compact DIP type SSR** Ideal for AC load control

# **AQ-H RELA**



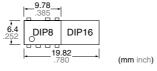




**RoHS** compliant

# **FEATURES**

- 1. Supports 0.3 A, 0.6 A, 0.9 A and 1.2 A ON-state RMS currents.
- 2. The 1.2 A type saves space with a DIP 8-pin package.



#### 3. Handles both 100 and 200 V AC loads

This relay handles both voltages in a single product. It is not necessary for users that use both types to manage separate part numbers.

4. High dielectric strength: 5,000 V AC (between input and output)

5. Two types available: Zero-cross type and Random type

# TYPICAL APPLICATIONS

- 1. Home appliances (air conditioner, microwave oven, washing machine, personal hygiene system, refrigerator, fan heater, inductive heating cooker, rice cooker and humidifier, etc.)
- 2. Industrial equipment

### **TYPES**

Type -	Output rating*			Part No.					
			Timo	Through hole terminal	Surface-mount terminal			Packing quantity	
	Repetitive	ON-state RMS	- Type	Tube packing style	Tube packing style	Tape and reel packing style			Tono and
	peak OFF- state voltage	current				Picked from the 1/2/3/4-pin side	Picked from the 5/6/8-pin side	Tube	Tape and reel
	600 V	0.3 A	Zero-cross	AQH0213	AQH0213A	AQH0213AX	AQH0213AZ	1 tube contains 50 pcs. 1 batch contains 500 pcs.	1,000 pcs.
		0.6 A		AQH1213	AQH1213A	AQH1213AX	AQH1213AZ		
		0.9 A		AQH2213	AQH2213A	AQH2213AX	AQH2213AZ		
AC type		1.2 A		AQH3213	AQH3213A	AQH3213AX	AQH3213AZ		
		0.3 A	Random	AQH0223	AQH0223A	AQH0223AX	AQH0223AZ		
		0.6 A		AQH1223	AQH1223A	AQH1223AX	AQH1223AZ		
		0.9 A		AQH2223	AQH2223A	AQH2223AX	AQH2223AZ		
		1.2 A		AQH3223	AQH3223A	AQH3223AX	AQH3223AZ		

<sup>\*</sup> Indicate the repetitive peak OFF-state voltage and ON-state RMS current: peak AC.

Note: For space reasons, the SMD terminal shape indicator "A" and the package type indicator "X" and "Z" are omitted from the seal.

#### **RATING**

## 1. Absolute maximum ratings (Ambient temperature: 25°C 77°F)

Item		Symbol	AQH0213, AQH0223	AQH1213, AQH1223	AQH2213, AQH2223	AQH3213, AQH3223	Remarks
Input	LED forward current	lF					
	LED reverse voltage	VR					
	Peak forward current	IFP		f = 100 Hz, Duty Ratio = 0.1%			
Output	Repetitive peak OFF-state voltage	VDRM					
	ON-state RMS current	IT (RMS)	0.3 A	0.6 A	0.9 A	1.2 A	
	Non-repetitive surge current	Ітѕм	3 A	6 A	9 A	12 A	60Hz, 1 cycle
I/O isolation voltage		Viso					
Operating temperature		Topr		Non-condensing at low temperatures			
Storage temperature		T <sub>stg</sub>					

Note: "A", "AX" and "AZ" at the end of the part numbers have been omitted.

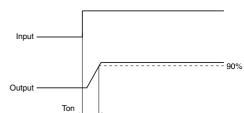
#### 2. Characteristics (Ambient temperature: 25°C 77°F)

Item			Symbol	AQH0213, AQH1213, AQH2213, AQH3213	AQH0223, AQH1223, AQH2223, AQH3223	Remarks
Input	LED dropout voltage	Typical	VF	1.21 V		I <sub>F</sub> = 20 mA
		Maximum		1.3 V		
	LED reverse current	Typical	l <sub>R</sub>	_		
	LLD levelse current	Maximum		10 μΑ		V <sub>R</sub> = 6 V
Output	Peak OFF-state current	Typical		_	_	I <sub>F</sub> = 0 mA
		Maximum	IDRM	100	100 μΑ	
	Peak ON-state voltage	Typical	Vтм	_		I <sub>F</sub> = 10 mA I <sub>ТМ</sub> = Max.
		Maximum	VTM	2.5 V		
	Holding current	Typical		_		
		Maximum	Ін	25 mA		
	Critical rate of rise of OFF-state voltage	Minimum	dv/dt	200 V/μs		$V_{DRM} = 600 \text{ V} \times 1/\sqrt{2}$
Transfer charac- teristics	Trigger LED current	Maximum	lft	10 mA		V <sub>D</sub> = 6 V R <sub>L</sub> = 100 Ω
	Zero-cross voltage	Maximum	Vzc	50 V	_	I <sub>F</sub> = 10 mA
	Turn on time*	Maximum	Том	100 μs		$I_F = 20 \text{ mA}$ $V_D = 6 \text{ V}$ $R_L = 100 \Omega$
	I/O isolation resistance	Minimum	Riso	50 GΩ		500 V DC

Notes: 1. For type of connection, see page 44.

2. "A", "AX" and "AZ" at the end of the part numbers have been omitted.

#### \*Turn on time



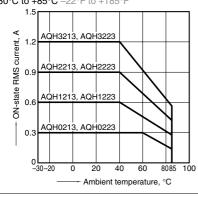
#### RECOMMENDED OPERATING CONDITIONS

Please follow the conditions below in order to ensure accurate operation and release of the phototriac coupler.

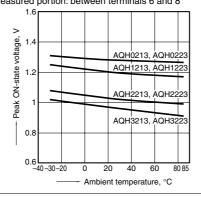
Item	Symbol	Value	Unit	
Input LED current	lF	20	mA	

# REFERENCE DATA

1. ON-state RMS current vs. Ambient temperature characteristics Allowable ambient temperature: -30°C to +85°C -22°F to +185°F

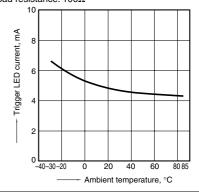


2. Peak ON-state voltage vs. Ambient temperature characteristics LED current: 10 mA; ON current: Max. Measured portion: between terminals 6 and 8

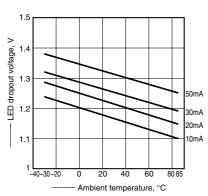


3. Trigger LED current vs. Ambient temperature characteristics

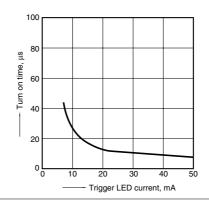
Load voltage: 6 V DC; Load resistance: 100Ω



4. LED dropout voltage vs. Ambient temperature characteristics LED current: 10 to 50 mA

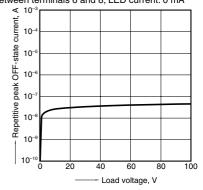


5. Turn on time vs. LED current characteristics Load voltage: 6 V DC; Load resistance:  $100\Omega$ Measured portion: between terminals 6 and 8

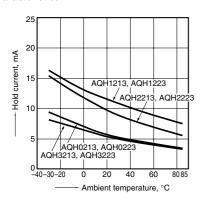


6. Repetitive peak OFF-state current vs. Load voltage characteristics

Ambient temperature: 25°C 77°F; Measured portion: between terminals 6 and 8; LED current: 0 mA

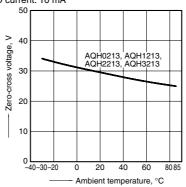


#### 7. Hold current vs. Ambient temperature characteristics



8. Zero-cross voltage vs. Ambient temperature characteristics

LED current: 10 mA



# **DIMENSIONS** (mm inch)

The CAD data of the products with a CAD Data mark can be downloaded from: http://industrial.panasonic.com/ac/e/

#### Through hole terminal type

CAD Data

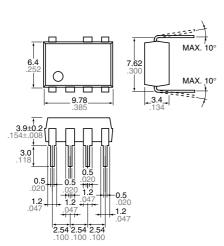
External dimensions



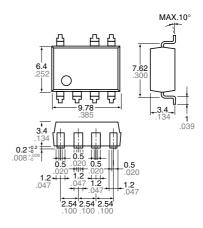
Surface mount terminal type

# External dimensions





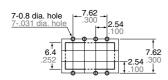




Terminal thickness: 0.25 .010 General tolerance: ±0.1 ±.004

Terminal thickness: 0.25 .010 General tolerance: ±0.1 ±.004

# PC board pattern (BOTTOM VIEW)



Tolerance: ±0.1 ±.004

#### Recommended mounting pad (TOP VIEW)



Tolerance: ±0.1 ±.004

## SCHEMATIC AND WIRING DIAGRAMS

Notes: E1: Power source at input side; IF: Trigger LED forward current; VL: Load voltage; IL: Load current

